

WHAT IS CLAIMED IS:

- 5     1.     A computer drive pack assembly comprising:
- a)     a principal enclosure;
- b)     a housing within the principal enclosure, the housing adapted for removal  
                 and transport from the principal enclosure, the housing containing a  
                 plurality of drives, each of the plurality of drives adapted for removal from  
10           the housing; and
- c)     at least one RAID controller within the principal enclosure and operatively  
                 connected to one or more of the plurality of drives, the at least one RAID  
                 controller configured to store data for the connected drives.
- 15     2.     The assembly of claim 1, wherein the at least one RAID controller is operatively  
                 connected to each of the plurality of drives.
3.     The assembly of claim 1, wherein the at least one RAID controller is operatively  
                 connected to data streams and data pathways of the drives.
- 20           4.     The assembly of claim 1, wherein the at least one RAID controller is in  
                 communication with the drives when the housing is within the primary enclosure.
5.     The assembly of claim 1, wherein the data comprises redundant data.

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6. The assembly of claim 1, wherein the housing includes a drive circuit having electrical components and connectors operatively coupled to each of the plurality of drives, the circuit adapted to provide individual power and data control to each of the plurality of drives, whereby the circuit operatively connects the plurality of drives to the at least one RAID controller.

7. The assembly of claim 1, wherein the housing includes an electronic connector adapted to form an electronic interconnection between the drives within the drive pack and any engaging mechanism, whereby the electronic connector operatively connects the plurality of drives to the at least one RAID controller.

8. The assembly of claim 1, wherein the principal enclosure includes an enclosure circuit having a plurality of electrical connectors and one or more processors, the plurality of connectors adapted to engage and interconnect the drive pack and the at least one RAID controller, the one or more processors adapted to individually control the operation of the plurality of drives, whereby the enclosure circuit operatively connects the at least one RAID controller to the plurality of drives.

9. The assembly of claim 1, wherein the at least one RAID controller is configured to provide the data to the plurality of drives prior to a housing being removed.

10. The assembly of claim 1, wherein the at least one RAID controller is adapted for removal and transport from the principal enclosure.

11. A computer drive pack assembly comprising:

- 5 a) a principal enclosure;
- b) a drive pack operatively coupled to the principal enclosure and adapted for removal and transport from the principal enclosure, the drive pack containing a plurality of drives, each of the plurality of drives adapted for removal from the housing;
- 10 c) one or more support modules, each of the one or more modules operatively coupled to the principal enclosure; and
- d) an enclosure circuit operatively coupled to the principal enclosure, the enclosure circuit configured to interconnect the drive pack and the one or more support modules.

15 12. The assembly of claim 11, wherein the one or more support modules includes one or optionally more of at least one power supply, at least one RAID controller, at least one fan pack, at least one RAID controller, a rechargeable battery backup unit, and an user interface module.

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13. The assembly of claim 11, wherein each of the one or more support modules comprises a unit separate from the principal enclosure, each of the one or more support modules adapted for removal from a bay in the principal enclosure.

5 14. The assembly of claim 11, wherein the securement of the drive pack, the one or more support modules, and the enclosure circuit to the principal enclosure enables the principal enclosure to be ruggedized.

10 15. The assembly of claim 11, wherein the drive pack includes a drive circuit having electrical components and connectors operatively coupled to each of the plurality of drives, the drive circuit adapted to provide individual power and data control to each of the plurality of drives, whereby the drive circuit is operatively connected to the one or more support modules to the drive pack.

15 16. The assembly of claim 11, wherein the drive pack includes an electronic connector positioned at a posterior side of the housing, whereby the connector is adapted to form a sole electronic interconnection between the drives within the drive pack and any engaging mechanism, whereby the electronic connector operatively connects the one or more support modules to the drive pack.

20 17. The assembly of claim 11, wherein the enclosure circuit includes a plurality of electrical connectors and one or more processors, the plurality of electrical connectors adapted to engage and interconnect the one or more support

modules to the drive pack, and the one or more processors adapted to individually control the operation of the plurality of drives.

18. The assembly of claim 11, wherein the engagement of the enclosure circuit  
5 between the drive pack and the one or more modules provides a mechanism for data storage from the plurality of drives to the one or more support modules.

19. A method of creating a redundant data system in a computer drive pack assembly comprising:

- 10 a) providing a principal enclosure having one or more support modules and an enclosure circuit contained therein;
- b) providing a drive pack adapted for removal and transport from the principal enclosure, the drive pack comprised of a housing containing a plurality of drives and a drive circuit, each of the plurality of drives adapted  
15 for removal from the housing; and
- c) coupling operatively the drive pack to the principal enclosure.

20. The method of claim 19, further comprising coupling operatively each of the one or more support modules to the enclosure circuit in the principal enclosure and  
20 coupling operatively each of the plurality of drives to the drive circuit in the drive pack.

21. The method of claim 20, wherein the step of coupling the drive pack to the principal enclosure further comprises coupling operatively the drive circuit to the enclosure circuit so as to interconnect the plurality of drives of the drive pack to the one or more support modules of the principal enclosure.

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22. The method of claim 19, wherein the step of providing the principal enclosure having one or more support modules comprises having one or optionally more of at least one power supply, at least one RAID controller, at least one fan pack, at least one RAID controller rechargeable battery backup unit, and an user interface  
10 module.

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23. The method of claim 22, wherein the step of providing each of the at least one RAID controller further comprises operatively connecting data streams and data pathways of the drives to the at least one RAID controller in order to store  
15 redundant data of the plurality of drives.

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24. The method of claim 19, further comprising a step of removing one or more of the plurality of drives from the drive pack while the computer drive pack assembly is energized, during in-band or out-of-band communication, or during storage  
20 media data access.

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25. The method of claim 19, further comprising a step of removing the drive pack from the principal enclosure while the computer drive pack assembly is energized and during in-band or out-of-band communication.

5 26. The method of claim 19, further comprising a step of removing one or more of the plurality of support modules from the principal enclosure while the computer drive pack assembly is energized, during in-band or out-of-band communication, and during storage media data access.

10 27. A method of enabling a plurality of drives to function properly within a computer drive pack assembly following insertion of a drive pack containing the plurality of drives into the computer drive pack assembly, comprising:

- a) powering the drive pack;
- b) initializing a drive circuit of the drive pack to default control status with an  
15 electronic circuit within the computer drive pack assembly;
- c) testing the drive pack;
- d) enabling the plurality of drives on back-end storage media interfaces of the computer drive pack assembly;
- e) powering the plurality of drives within the drive pack;
- 20 f) testing the plurality of drives for readiness;
- g) reading data from the plurality of drives;
- h) synchronizing the computer drive pack assembly with data from the plurality of drives; and

- i) setting one or optionally more of visual, audio, and in/out of band notifications that proper functioning between the plurality of drives of the drive pack and the computer drive pack assembly is now available.

5     28.     The method of claim 27, wherein the drive pack powering step further comprises using a debounce delay period during which proper securing of the drive pack can be made within the computer drive pack assembly.

10     29.     The method of claim 27, wherein the drive pack testing comprises testing the functioning of the drive circuit.

29.     The method of claim 27, wherein the drive powering step comprises powering the drives in a staggered sequence.

15     30.     The method of claim 27, wherein the drive data reading step comprises reading media resident configurations.

31.     The method of claim 27, further comprising the step of checking an environmental condition of the drive pack.

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32.     The method of claim 31, further comprising the step of initiating a sequence to remedy the environmental condition.



33. A computer readable medium comprising the instructions for performing the method of claim 27.

34. A method of enabling a plurality of drives to function properly within a second computer drive pack assembly following removal of a drive pack containing the plurality of drives from a first computer drive pack assembly, comprising:

a) disabling further data transfers between the drives and the first computer drive pack assembly;

b) flushing write-cache to the plurality of drives;

c) bypassing individual drives from internal data buses;

d) powering down a plurality of drives within the drive pack;

e) setting controls and statuses for drive pack disengagement;

f) setting one or optionally more of visual, audio, and in/out of band notifications that user can now safely remove the drive-pack; and

g) setting one or optionally more of visual, audio, and in/out of band notifications of any errors in the drive-pack ejection sequence.

35. The method of claim 34, wherein the write-cache flushing step further comprises writing one or optionally more of configuration information, drive pack statuses, and logging information to the plurality of drives.

36. The method of claim 34, wherein the drive powering step comprises powering the drives in a staggered sequence.

37. The method of claim 34, wherein the controls and statuses setting comprises disabling media interfaces between the drive pack and the computer drive pack assembly.

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38. A computer readable medium comprising the instructions for performing the method of claim 34.